

T. S. Prich

4S Society for Social Studies of Science

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IMPORTANT: BALLOTS TO RETURN BY 15 JUNE 1977: PAGES 19-22

Annual Meeting: Announcement.

The Second Annual Meeting of the Society for Social Studies of Science will be held at Harvard University, Cambridge, MA on 14-16 October 1977.

The program will include invited speakers, special sessions, and contributed papers. Persons who wish to report on research in progress (15 minute presentations) or to offer full reports of research results or other scholarly contributions (30 minute presentations) should send notice of them to the 4S Referee Committee, c/o Lowell Hargens, Department of Sociology, Indiana University, Bloomington, IN 47401. The Committee will refer materials received to appropriate specialty referees. It is planned to have some parallel sessions giving opportunity for comments by designated discussants, and for discussion among those attending. Contributions will be made available in printed Proceedings of the meeting.

The Program Committee, consisting at this time of Lowell Hargens (Indiana University), Dorothy Nelkin (Cornell University), Sal Restivo (Rensselaer Polytechnic Institute), Dorothy Zinberg (Harvard University), and Warren Hagstrom (University of Wisconsin) expects that such topics as scientific communication, specialty development, and bibliometrics, well represented at the first meeting, will be well represented again. The Committee is heeding the advice of Collins, Gieryn, and Nelkin (4S Newsletter, Winter 1977) and others and is soliciting contributions on topics not so well represented at Ithaca, such as sociological history of science, science policy, science and technology in developing nations, the economics of research and development, and contributions from relevant areas of anthropology, psychology, and philosophy. Fuller details on the program will be presented in the next issue of the Newsletter. Suggestions about special sessions, invited speakers, and meeting organization are welcomed by the Program Committee. Letters may be addressed to any member of the Committee but should be sent to them soon.

The Local Arrangements Committee is chaired by Dorothy Zinberg of Harvard University, Program in Science and International Affairs, Cambridge, MA 02138. Details on accommodation and travel will be presented in the summer issue of the 4S Newsletter.

Election of Council Members. The Nominations Committee (Jerry Gaston, Nelson Polsby, Brigitte Schroeder-Gudehus, Harriet Zuckerman, and chaired by President Hagstrom) has submitted the following slate for five positions on the Council. Three positions are to replace Nicholas Mullins, Derek de Solla Price, and Arnold Thackray, whose terms expire this year. Two positions are new, as provided by the Charter amendment approved at the 1976 annual meeting and submitted to the full membership at this time. Four positions are for terms of two years, the fifth for a term of one year. The four candidates receiving the most votes will be elected for two year terms, the one with the fifth most votes for a one year term. (In the unlikely event that the Charter amendment is defeated, the three candidates with the most votes will be elected to two year terms.) The BALLOT appears on the center pages. Please mark and detach it, then return in an envelope bearing your name and return address (this is to verify voting eligibility) to Robert McGinnis at Cornell University. THE DEADLINE FOR RECEIPT OF ALL BALLOTS IS 15 June 1977.

4S Society for Social Studies of Science

- President: Warren O. Hagstrom
- Secretary-Treasurer: Robert McGinnis
- Council: Jerry Gaston, Robert K. Merton (ex officio), Nicholas Mullins, Dorothy Nelkin, Derek de Solla Price, Arnold Thackray
- Senior Editor: Arnold Thackray
- Managing Editor: Daryl Chubin
- Editorial Advisors: Bernard Barber, Joseph Ben-David, Ruth Schwartz Cowan, Diana Crane, Jerry Gaston, Michael Gibbons, Gerald Holton, Camille Limoges, Peter Mathias, Ian Mitroff, Harold Orlans, Nelson Polsby, Nathan Rosenberg, Harvey Sapolsky, Steven Shapin, Merritt Roe Smith, John Ziman, Dorothy Zinberg, Harriet Zuckerman

Council Meeting. The 4S Council met on 4 February 1977 in Philadelphia, Pennsylvania. The Secretary-Treasurer has submitted the following summary of reports and resolutions:

Present: Jerry Gaston, Warren O. Hagstrom, Robert K. Merton, Nicholas Mullins, Robert McGinnis, Derek de Solla Price and Arnold Thackray. Absent: Dorothy Nelkin.

I. Minutes of the 3 November 1976 meeting of Council were approved.

II. Secretary-Treasurer's Report:

- A. As of 1 January 1977, 4S had 539 members.
- B. As of 1 January 1977, the Society had a balance of \$4,523.31 and an anticipated total income of \$6,391.01, including renewals and credits.
- C. Between September 1975 and the end of 1976, the Society had expended \$4,530.98.
- D. A budget of \$5,228 was approved for calendar year 1977.
- E. Council accepted with gratitude a gift of \$200 from Computer Horizons, Inc., which now becomes a Sponsoring Institution.
- F. The Secretary-Treasurer was directed to write to the Federation of American Scientists regarding a subscription and a note in its newsletter.
- G. Council approved a commitment of \$500 for local arrangements for the 1977 Annual Meeting and recognized an anticipated need for an additional \$1000. These funds would be recovered from registration fees.

III. Report of the Committee on Annual Meetings:

- A. The 1977 meeting will be held at MIT, Cambridge, Massachusetts in late October, 1977. Dorothy Zinberg has agreed to chair the Local Arrangements Committee.
- B. The 1978 and 1979 meetings will be held in Washington, DC and Montreal, in that order, unless 1978 proves to be more desirable from the Montreal delegation's perspective. Subvention will be sought for both meetings.
- C. Council agreed to concentrate a recruitment drive in the Boston area in anticipation of the 1977 meeting.

IV. Report from President Hagstrom:

- A. Nominations and Program Committees are being formed. They will reflect the multidisciplinary character of 4S.

Council Meeting (Continued).

- B. It was agreed to instruct the Nominations Committee that the phrase "at least one nominee" (Charter Clause II, b.3) shall be interpreted to mean that two candidates shall be sought for each available position. The positions to be filled are those now occupied by Council members Mullins, Price and Thackray, whose terms expire in October 1977.

V. Publications

- A. Arnold Thackray announced that he should have to resign editorship of the Newsletter and Chairmanship of the Publications Committee (effective 30 June 1977) due to an impending sabbatical leave to be spent abroad. Council expressed its great appreciation on behalf of the Newsletter and Publications Committee for his excellent services.
- B. A letter of resignation (effective 30 June 1977) was received from Managing Editor Daryl Chubin. Council reluctantly accepted the letter and expressed its deep appreciation for his substantial contribution to 4S.
- C. Council member Jerry Gaston was appointed to chair the Publications Committee effective upon the resignation of Arnold Thackray and to serve at the pleasure of Council.
- D. Council agreed that Gaston and Thackray should be authorized to negotiate with candidates for the positions of Senior Editor and Managing Editor, on behalf of the Council. Council further agreed on the importance of maintaining a balance of disciplinary expertise in the editorial structure.
- E. It was agreed that a continuing, evolutionary development of the 4S Newsletter represented the wisest course for the Society [see Publications Committee, below]. At the same time, discussion of possible relationships is continuing with the editors of several journals, including Social Studies of Science, Minerva and Newsletter on Science, Technology & Human Values.
- F. Council agreed that, in the interests of all 4S members, the Society should express its willingness to provide whatever possible assistance the editors of Minerva and Social Studies of Science might seek and to maintain its cordial relations with those excellent journals.

VI. Other Business:

- A. Derek de Solla Price reported that the AAAS Committee on Affiliation has approved the request that 4S become an affiliate member. Final action will be taken by AAAS Council during the Annual Meeting on 23 February [see AAAS Affiliation, below].

Council Meeting (Continued).

- B. Council agreed that it would be appropriate for 4S to take responsibility for the management of a Kaplan Memorial Fund, the earned income from which would be used to provide a periodic award for distinguished contributions to social studies of science. Council agreed that emphasis should be placed on the contribution of younger scholars.
- C. Council agreed that, in light of the budget report, it would be necessary to continue the practice of requiring members to meet their own expenses for travel to Council meetings.
- D. The next meeting of the Council was set for Friday, 13 May 1977, at the University of Pennsylvania.

Publications Committee. The Publications Committee has been engaged in a wide polling of opinion, concerning the wisest course of action for 4S. The means used include the statement in the Newsletter (volume 1 number 4, pp. 3-4), the open meeting at Cornell in November and the subsequent published report (Newsletter volume 2 number 1, pp. 18-19) and the questionnaire sent out to Council, editorial advisors and other members of the Society with special knowledge of or concern in the publications area. Informal discussions and correspondence with editors of journals and other newsletters have also helped to clarify the options. As reported in Council Minutes the clear consensus is that:

- a. A newsletter format best suits the present needs of the Society.
- b. 4S will continue to seek good collegial relations with other journals and newsletters in the field, including reduced subscription arrangements for members of the Society.
- c. There is a strong sentiment in favor of having the Newsletter continue on its pathway of cautious evolution. While the common hope is that 4S may eventually be able to sponsor an independent journal, timing of any such development must depend on the maturing of the Society, the identifying of suitable sponsors and the broader economic situation.
- d. The Publications Committee will keep a watching brief in these matters. Participation in a joint inter-society newsletter remains a live option, as does participation in a joint venture with some other journal.

The Publications Committee of the Society remains committed to two aims. The first is to be a good neighbor to cognate journals in such fields as economic history, history of science, history of technology, philosophy of science, political science, science policy and sociology. The second is to find the proper forms through which 4S may "help to convert an impressive congeries of disparate programs of research on science into an even more impressive composite field of disciplined inquiry." Those forms must surely include publications, as befits a fledgling but determined newcomer to the ranks of learned societies.

Nominations Committee. The Nominations Committee requested the Council to consider providing some guidelines for Charter revisions. The Charter currently requires the list of nominees to be presented to the membership six months in advance of the annual meeting; this seems unnecessarily long. The Charter makes no provision for nomination by petition or write-in votes. It gives the President full authority to select a Nominations Committee. The Nominations Committee has discretion to use a variety of forms for balloting for Council positions, from a single ballot (as on this occasion) to separate ballots for each open position (as in our previous election). Finally, the first two Nominations Committees chose to nominate only persons who could attend Council meetings at their own expense. This has tended to restrict nominees to those in North America or even Eastern North America. Procedures might be considered that would give those residing elsewhere a more formal voice in the governance of the Society.

4S Affiliated With AAAS. The Council of the American Association for the Advancement of Science approved the affiliation of 4S at its meeting of 23 February in Denver. Ordinarily the AAAS accepts organizations as affiliates only if they have been in existence at least five years, but this requirement was waived for 4S. Affiliation will enable 4S to organize sessions at AAAS meetings and to appoint representatives to its section committees. 4S is now enrolled in Section X, General, but expects to cooperate with other sections as well. The 4S Council has informed AAAS of its intention to sponsor a session on "Science Indicators" at the AAAS meeting in Washington, DC, 12-18 February 1978.

THOUGHT AND OPINION

Councillor's Commentary

Nicholas C. Mullins

Indiana University

Social studies of science is a designation that includes interesting intellectual work and the authors of that work which current social arrangements do not bring together. The name is also a coinage that reflects an interest in reaching as wide as possible a collection of those who do social studies of a science, without defining that too precisely.

The inner logic of the subject matter or the current social arrangements do not support 4S. There are other activities, both personal and professional, with much higher immediate rewards. Support for 4S is an investment in institution building. I feel that my work has been improved by contact with a wide range of scholars, and that the social arrangements which support that kind of contact on a regular basis must be made by those who find them valuable.

4S is social arrangement that supports meetings, a newsletter and soon a journal which are all themselves arrangements that have served to notify scholars of one another's existence and to help bring them together. 4S also acts as all societies do to define an area and to give it a character. It is my hope that the process of definition does not draw the boundaries too close--either intellectually or geographically. I intend to work for a broadly based scientific society inclusive of a large range of work and persons.

On 4S

Harold Orlans

National Academy of Public Administration Foundation
Washington, DC

My interest in studying scientific affairs was aroused during five years on the staff of the National Science Foundation and gratified during thirteen years at the Brookings Institution. That interest rooted on graduate work in anthropology, an interest in the sociology and politics of knowledge and the professions, an aversion to intellectual pretension, and a disposition, common in Washington, to note the motives underlying supposedly disinterested actions. (Daniel Moynihan relates how, upon hearing that a certain minister had dropped dead of a heart attack, Metternich asked, "Now, what was his motive?") The efforts of scientists to obtain more knowledge, money, acclaim, and power do not necessarily accord with the public's interest in obtaining essential, but not excessive or excessively costly, knowledge, and in a broad distribution of prestige and power. Many scholars of science adopt the inflated view that scientists often have of their own importance. Science is important, but so is carpentry, industry, music, farming, and garbage collection; none can claim primacy and, at this juncture, the nation may well benefit more from greater expenditures for garbage collection than for graduate education and scientific research. It behooves the scholar of science to maintain a critical detachment from his subject, to examine it in its historical context, and to leave the naive advocacy of the wonders of science to university lobbyists and encyclopedia salesmen.

A new society resembles a new baby: all hope and weak sphincters. The opportunity to sort things out, to identify and meet members' interests, accompanies an opportunity to attract new members and define the character of a new fraternity. We are most fortunate in the circumstances that have brought together historians and sociologists of science. American social science has been too long divorced from history; a reunion can strengthen both fields.

I would like to see at least three contingents more strongly represented in 4S.

1. Political scientists and students of public administration (e.g., Robert Gilpin, Don Kash, Sanford Lakoff, Henry Lambright, Don Price, Harvey Sapolsky, Eugene Skolnikoff, Bruce Smith, Christopher Wright).
2. Spokesmen for and administrators of scientific institutions and associations (e.g., Philip Abelson, Harvey Brooks, William Carey, Philip Handler, Caryl Haskins, Charles Kidd, Gerard Piel, Frederick Seitz, Chauncey Starr, Alvin Weinberg).
3. Staff of governmental science programs (such as those of the Energy Research and Development Administration, the National Institutes of Health, and the National Science Foundation) and of Congressional committees and agencies (such as the Congressional Research Service and the Office of Technology Assessment).

On 4S (Continued).

The political scientists should fit in most readily; participation of the latter two groups might be encouraged by invitations to contribute to society publications and meetings, and by special invitations to scientists and administrators in the vicinity of society meetings to join our discussions. If our common objective is to understand better the gross and subtle, general and special factors and circumstances from which scientific knowledge emerges, we dare not prejudge the answers to our ill-formed questions, or mistake a partial answer for the whole truth. We must remain as open to surprises and as hospitable to new evidence and new ideas, whatever their source, as the true scientist.

The Internationality of 4S

Michael J. Moravcsik

Institute of Theoretical Science,
University of Oregon

At the first annual meeting of 4S, the following motion was passed: "It is the strong desire of this society that the participation in its activities be available to interested people in all countries of the world." As a principle, the content of this resolution is so self-evident that its proclamation appears almost superfluous. Indeed if science is to a large extent universal, objective, and hence of international concern, the science of science is even more so, and hence it is quite evident that participation in the study of science should be equally available to interested and contributing people regardless of where in the world they happen to have been born or wherever they reside.

As a matter of practice, however, it is not so evident that without some attention to this aim, participation will automatically be available to anybody anywhere. The point simply is that many factors playing important roles in shaping worldwide interactions are in fact not international in spirit, and hence equality cannot be assumed to exist if matters are left completely to their own devices, to meander along paths of least resistance.

As an example, and because of my continued interest in this direction, I would like to discuss briefly the situation with respect to potential participants from so-called developing countries. There will probably be little dissent from my assertion that since these countries are in the process of building up their science "from scratch", whereas the United States, Germany, or Japan (and a number of other countries) now have "only" the task of extending an already well established scientific infrastructure, the developing countries are likely to benefit even more from presumed insights offered by science studies than the scientifically advanced countries. What, then, are the obstacles in the path of an equitable opportunity for participation by the developing countries?

At the moment, the primary or perhaps even sole function of 4S lies in professional communications of various sorts. We have a newsletter and might become involved in professional journals; we organize meetings and offer opportunities for informal interactions between people with overlapping interests within science studies. So our question should be: Assuming laissez-faire, do interested persons from developing countries have equal opportunities to participate in these modes of professional communication within 4S?

The Internationality of 4S (Continued)

The answer is clearly no for the obvious reasons that cause a general disparity in all patterns of scientific communication. The Matthew principle, well known in 4S circles, works with particular vengeance in scientific communication, as I have elaborated previously on numerous occasions.¹ Journals are expensive, must be subscribed to in hard currency, and travel slowly to far-away places. Preprints are sent preferentially to groups who already have a good reputation in the field, and to whom postage is cheap, thereby eliminating most groups or individuals in developing countries. Notices of meetings are circulated much more efficiently within the "advanced" community with well identified and concentrated manpower (which, in any case, has much better access to the "grapevine" of professional news and rumors). Meetings themselves are likely to be held in geographical areas with a high concentration of potential participants and with existing and proven facilities to host meetings, thus again placing developing countries at a disadvantage. Furthermore, meetings held in Europe or North America also mean that travel costs are maximized for precisely those whose travel funds are minimal and whose hard currency restrictions are the most severe.

Finally, channels of informal communication are also the sparsest in the developing countries. Visitors are relatively infrequent, postal and telephone connections comparatively weak, and the overall tradition of professional interaction, even domestically or regionally, is at best in a nascent stage.

It is not my aim to discuss whether these causes for the disparity at the cost of developing countries are justified or not, or whether they can, in the short run, be eliminated or not, although such a discussion might be rewarding in itself. At the moment, I prefer to opt for a simpler alternative, and explore -- given the above state of affairs -- whether one could take some steps to try to restore some semblance of equality among those interested in science studies in various parts of the world.

Such steps can be divided into two groups: measures which require mainly a bit of thought and effort, but practically no money; and steps which involve non-negligible, out-of-pocket financing.

Among the first, we come immediately to matters of publicity. I believe that 4S should launch a strenuous effort to make its existence known in developing countries. Free publicity in those countries could be obtained through negotiations with local journals like Science and Culture, regional journals like Interscencia, and international journals like Science, Minerva, or Social Studies of Science, as well as through fliers sent to existing 4S members for distribution to their acquaintances in developing countries in the course of their normal correspondence with them.² Such publicity material should also offer a procedure for joining 4S which takes into account

¹ See M.J. Moravcsik, Science Development - The Building of Science in Less Developed Countries, PASITAM, Bloomington, Indiana, Second Printing, 1976, Chapter 4 and many references given in it.

² It is likely that most of those in the developing countries who are interested in science studies will come from a background in the natural sciences.

The Internationality of 4S (Continued).

the particular financial and hard currency limitations existing in certain parts of the world. After an initial awareness, communication with members in those countries can be maintained routinely through the 4S Newsletter which will have to be sent air mail printed matter (AO mail) to far-away members. Since the percentage of 4S members from those countries would at the very most be 10% of the total membership, such extra postage will not be a heavy burden, and in no way heavier than communicating with members in Europe (who presumably also get their Newsletter by air) [Indeed they do. The Editors].

Another type of "free" measure consists of incorporating into both the programs of 4S meetings and the publications of our Society some contributions of particular interest to developing countries, just as our first meeting featured sessions devoted to work done in Eastern Europe. Such material need not be by scientists and scholars from developing countries, but could also pertain to studies of science in those countries done by people from elsewhere.

Such breadth in programming would not only make 4S even more interesting for developing countries, but also might make actual participation in Society activities easier for members residing in developing countries. Since travel costs are high and resources low, each travel request in those countries must be amply documented, and thus Society activities explicitly pertinent to science problems in those countries would make such requests more eligible for assistance. Similarly, explicit personal invitations, perhaps in the form of an offer to chair a session or a request for an invited talk, might contribute substantially.

To avoid any misunderstanding, I want to emphasize that I abhor quotas, consider reverse discrimination stupid and detestable, and view many of today's "affirmative action" activities as counterproductive. At no point do I want to even appear to suggest that the above steps be taken without adhering to the usual scientific and scholarly standards, and evaluation by merit only. What I do advocate is the application of such considerations within the broader horizon of worldwide manpower, rather than within the traditional framework of considering a priori only those few countries which are conspicuously active at present.

The second group of measures would involve non-negligible financial resources, and it is clear to me that, at present, our fledgling society cannot even think of channeling some of its own modest resources into such financing. After all, the society's total assets are of the order of a few thousand dollars, and the participation of one person from, say, Sri Lanka to a 4S meeting in, say, Madison, Wisconsin, would amount to something like \$2000. Thus outside funds are the only source.

In order to encourage such outside funding, however, 4S can be effective in various ways. Sometimes invitations for brief visits, coinciding in time with 4S meetings and financed from research grants members may have, can defray at least some part of the total expenses. Furthermore, with 4S now on record as favoring the principle of such participation by our far-away colleagues, individual members of 4S who might be particularly interested in this issue and who might also be knowledgeable about locating sources for external funding, can exert themselves in cooperation with potential participants from the developing countries to secure such external funding. Such

The Internationality of 4S (Continued).

a search is likely to be more successful if it becomes widely known that the Society is indeed eager for such participation and that its activities do benefit substantially those who are involved in science building in developing countries.

I do not believe that any of this requires, at the present, any formal action by the Society or any formal suborganization within the Society. The existing decision-making bodies and individuals are likely to be sufficiently sensitive to the requirements of this issue, and other members actively interested in it can communicate with each other through our Newsletter or privately. Ideas, suggestions, and comments about this topic from individual members will be very much appreciated, and can be directed to the Newsletter, to any of the Society's officers, or to me as an interested member.

Conference on Retrospective Technology Assessment

Ruth Schwartz Cowan, SUNY, Stony Brook
Jon D. Miller, Northern Illinois University
Roberta Miller, Social Science Research Council

Carnegie-Mellon University, in cooperation with the National Science Foundation, sponsored a conference on Retrospective Technology Assessment on 1-4 December 1976, at Seven Springs Mountain Resort in Champion, Pennsylvania. The conference was organized by Joel Tarr, Director of the Program in Technology and Humanities at Carnegie-Mellon, and the keynote address was delivered by Daniel DeSimone, Deputy Director of the Office of Technology Assessment. Conference participants came from the academic community, government agencies, and the contract research community.

The term "technology assessment" was coined ten years ago by Emilio Daddario, then a member of the House of Representatives, who held hearings on the process of change and adjustment in society resulting from technological innovation. He used the term to describe studies of the intended and unintended effects of such changes. In order to make technological assessments available for public policy considerations, the Technology Assessment Act was signed into law in October 1972, and the Office of Technology Assessment was established in January 1974, to provide technological assessments to the Congress.

One of the purposes of technology assessment is to anticipate the direct and indirect -- as well as the intended and unintended -- impacts of the introduction of a new technology on society. In order to study processes of technologically introduced change over time, the National Science Foundation sponsored four studies which they called retrospective technology assessments. These were historical studies of new technologies and their effects on society. Not truly retrospective in the sense of examining historical data from one point in time to an earlier point in time, these studies were, instead, prospective examinations of historical events from an earlier to a later date. It was felt that the long time period afforded by historical studies could show more about the range of intended and unintended effects of technology than is possible with contemporary technology assessments which simply monitor the ongoing consequences of new technologies. It was also hoped that these studies would define or, at the least, identify better methodologies for technology assessment.

Retrospective Technology Assessment (Continued).

The Carnegie-Mellon conference was directed toward similar issues. It was organized 1) to encourage the development of improved methodologies for technology assessment, and 2) to increase our understanding of the effects of technological change on society and thus to improve present and future public policy in technology-related areas. To accomplish these purposes, the program of the conference included both studies of the methodology of technology assessment, based on previous assessments, and case studies of the introduction of new technologies in the past. The case studies included papers on three of the National Science Foundation-sponsored studies (on the transatlantic cable, waste-water collection and treatment technology, and the

US Industrial Commission, a managerial innovation). In addition, there were three papers on the effects of transportation innovations, which dealt with the Erie Canal, the BART system in San Francisco, and airport planning and development. The program also included a paper on communications satellites and one on planning the expansion of electrical generating and transmission systems. Four of the case studies focused on nineteenth century innovations and four on new technologies or their dissemination in the twentieth century.

While there was little disagreement on the importance of the two purposes of the conference, there was some difference of opinion on the validity of the historical case study method for achieving those purposes. This method was implicitly supported in the organization of the conference by its concentration on case studies. It was also the basis for the support for four retrospective technology assessments by the National Science Foundation. Alan L. Porter also addressed this issue, arguing that case studies of past innovations were needed to complement the experimental and quasi-experimental design possible in assessments of contemporary technologies. However, Joshua Menkes (National Science Foundation), commenting on the papers at the conclusion of the conference, questioned the applicability of certain of the case studies to contemporary policy issues. More than subject matter was involved in Menkes' objections to these studies. He felt that technology assessments must be undertaken from a broader perspective than that afforded by case studies. Rather than building up a data base of information about the impacts of particular technologies, he suggested that future work in the field be directed toward defining the major issues in technology assessment and dealing with our inability to eliminate the uncertainty endemic to long-term forecasting with significant unknown variables.

In general, the case study approach to technology assessment was accepted by conference participants whose disciplinary perspectives emphasized the accumulation of a variety of data from which general patterns of social behavior and response could be determined and was distrusted by participants who were less interested in general patterns of response than in the policy implications of evolving technologies today. Both groups shared similar goals for technology assessment; they differed in their patience en route to achieving them.

The papers of the conference will be published. For details contact Joel Tarr, Program in Technology and Humanities, Carnegie-Mellon, Pittsburgh, PA 15213.

ERRATUM

In our presentation of Nelson W. Polsby's "Introduction of Robert K. Merton written for the Occasion of his Presidential Address" in the Winter 1977 issue (pp. 15-16), the last three paragraphs of text were inadvertently omitted. The missing paragraphs read as follows:

"As we come together for the first time from our various disciplines and universities and countries to seek the comfort and the stimulation of companionship in the social study of science to which we have individually committed ourselves, perhaps the greatest comfort, the most poignant stimulus that we can possess together is the mutual recognition of exemplary work. When such work is available to our eyes, we can rest assured that the purposes for which we come together are not vain purposes, but rather are concretely embodied in the accomplishments of our exemplars.

That, I think, is the special meaning that comes to us tonight as an added dimension to the words Bob Merton is about to share with us. We can look at the landscape he has illuminated for us and recognize it as a goodly portion of the charter grant to our society, the intellectual territory that we, as a scientific community, hereafter intend to hold in trust for our successors and for the cultivation and beneficial use of human beings everywhere.

The sociologist Arthur Stinchcombe once wrote, "Robert K. Merton was a classical writer who ranked with Durkheim, Marx, and Trotsky in my earlier intellectual life. I have been a bit bewildered by his becoming a contemporary as I grow older." Ladies and gentlemen, it is my bewildering, but exhilarating privilege to present to you our contemporary, President Robert K. Merton."

Letter to the Editor

Thank you for devoting a review symposium to my book Knowledge and Social Imagery. I think that having two partisan reviewers, one for and one against, is an excellent idea. There should be more of this. Let us hope that it is the beginning of a new trend. Certainly it was both amusing and instructive to compare the two reviews. Lest it be thought that I am writhing uncomfortably in the vice-like grip of Prof. Ben-David's logical argumentation let me declare at once that for my part I was well pleased with the outcome.

Letter (Continued).

Perhaps, though, I may be permitted one small observation. It seems easy to see why the practitioners of a social science would be impatient with philosophical attacks on them, but Prof. Ben-David is determined to reject a philosophical defence of his field. Interesting isn't it? I think that Knowledge and Social Imagery contains the answer to this puzzle.

David Bloor
University of Edinburgh

Sources of Resistance Among Scientists to Their
Classification on the Basis of Specialty

Warren O. Hagstrom
University of Wisconsin, Madison

Accompanying this issue of the 4S Newsletter is a membership questionnaire that, among other things, asks you to classify your three principal research interests. It is reasonable to believe that many members will find serious fault with the classification system used here or with the very idea of so narrowly specifying their research interests. This is suggested by the discussion of the topic produced at the February meeting of the 4S Council. The objections expressed were that most of us have manifold interests--"We are all seriously interested in almost all of the topics on the specialty list"--and that the classification used in the list is flawed, with skepticism expressed that any such list could be satisfactory. While the Council is not necessarily representative in a statistical sense of the membership, including at least two and maybe eight Renaissance persons,* it is likely that many in a Society such as ours will share these objections; those interested in the social studies of science are almost necessarily persons of broad interests and skills. Nevertheless, the consensus of the Council--those with late-scheduled departures--was that knowledge of major specialties would be of sufficient value to the Society, neophytes in the area, and the larger community, to warrant inclusion on the questionnaire.

Such a resistance to classification is quite general among scientists, as those of us who have attempted to get scientists to classify their research interests know very well. In my interviews with scientists I have often had to probe deeply to get them to indicate their major specialties, and the problems were compounded in surveys when I asked respondents to select major interests from a list of categories. Whence this resistance? Why should individuals so resist self-classification, when in fact most succeed in doing so in questionnaire surveys, and when outside observers ordinarily have little difficulty in placing

*Anachronism intentional: While during the Renaissance "Renaissance men" were (almost?) entirely men, today--those few there are--"Renaissance persons" may be of either gender.

Sources of Resistance (Continued).

workers into such categories as "gravitational waves," "neurospora genetics," "barnacle taxonomy," "social stratification of science," or "19th century institutional history of science"? I suggest there are two major sources to such resistance.

First, his specialty is a central aspect of the identity of each scientist. Specifying a specialty interest is making a claim about who one is, a claim others may not recognize. More important, it may be seen as an admission of what one is not (not "primarily," or not "among the top three" interests). Scientists tend to be committed to the view that all or much of science is "unified," that work in one area has implications for work in many other areas: it is in the interests of a scientist to have his work perceived as having very general implications. Being forced to select a limited number of specialties can be perceived as abandoning such claims. Thus, isn't it obvious that research on competition in science is part of such specialties as stratification and reward systems, communication processes, career patterns, the normative structure of science, productivity of scientists, and psychology of scientists ("ambivalence")---among others? Why should I have to choose?

Second, any classification system can be perceived as stating some "official" designation of the status of specialties, and legitimating or de-legitimizing research interests. When, in 1964, the NSF National Register of Scientific & Technical Personnel asked sociologists to classify their research interests, they asked respondents to select interests from a list that excluded any explicit reference to "sociological theory." Self-designated theorists were greatly annoyed and made many protests to the offices of the American Sociological Association. Members of this Society know that a decision to classify "sociology of knowledge and science" together rather than as two specialties is a hotly debated matter. Similarly, when the National Research Council's "Westheimer" report (1965) suggested major revision in the classification of research in chemistry, it implied such changes as blurring the distinction between inorganic and organic chemistry (a very well-established distinction), and "promoting" theoretical chemistry into a category of its own. Classification systems are properly viewed as having, in the broad sense of the term, political implications. More than half a century ago the British Census of India rashly decided to enumerate castes - "rashly" because the effort was seen as official governmental recognition of the status of castes and sub-castes, and the attempt stirred widespread public disorder. Our aspirations here are not so great; we view the classification scheme as tentative, to be revised, and as having enough utility to justify the effort. We do not perceive science to be ordered along caste lines, nor do we perceive specialty membership as being an ascribed characteristic. We hope not to generate identity crises or communal riots.

COMING ATTRACTIONS

- ** Second Annual Meeting: Arrangements
- ** Teaching Programs
- ** Griffith and Edge on Citations
- ** Reviews of Astronomy Transformed and Scientific Elite

COUNCIL MEMBERS AND CHARTER REVISION

There are ten nominees for the five vacant positions on Council as explained earlier (see Election of Council Members on page 3). Information on each of the ten, as reported by the Nominations Committee, is given below. After studying this material you should vote for no more than five of the candidates. Please DETACH, FOLD, SEAL, STAMP and MAIL (from overseas, airmail) the ballot so as to reach Robert McGinnis BY 15 JUNE.

Profiles

Key:

- a. Present position; b. Principal research interests; c. Two most recent publications

Donald DeB. Beaver (Ph.D. Yale 1966, History of Science)

- a. Professor of the History of Science, Williams College
- b. Social relations of science; 19th century U.S. science and technology
- c. "Reflections on the natural history of eponymy and scientific law," Social Studies of Science 6 (1976); "The Smithsonian origins of the Royal Society catalogue of scientific papers," Science Studies 2 (1972)

Jonathan R. Cole (Ph.D. Columbia 1969, Sociology)

- a. Associate Professor of Sociology, Columbia University
- b. Stratification and reward systems in science
- c. Peer Review at the National Science Foundation (with others; NAS-COSPUP, May 1977); Social Stratification in Science (with S. Cole, 1973)

A. Hunter Dupree (Ph.D. Harvard 1952, History)

- a. Professor of History, Brown University
- b. History of American science; history of measurement; social and biological systems
- c. "National patterns of American learned societies, 1769-1863," in Oleson and Brown, eds, The Pursuit of Knowledge in the Early American Republic (1976); "Biological and social theories: a new opportunity for a union of systems," in Nicholas Steneck, ed., Science and Society: Past, Present and Future (1975)

Loren Graham (Ph.D. Columbia 1964, History)

- a. Professor of History, Columbia University
- b. History of modern science with special reference to the Soviet Union
- c. Science and Philosophy in the Soviet Union (1972); "The place of the Soviet Academy of Sciences in the overall organization of Soviet science," forthcoming in John Thomas, ed., Soviet Science (NSF, 1977)

Michael J. Moravcsik (Ph.D. Cornell 1956, Physics)

- a. Professor of Physics and Institute of Theoretical Science, University of Oregon
- b. Science in developing nations; measures of scientific productivity; theoretical high energy physics
- c. Science Development: The Building of Science in Less Developed Countries (1975); "The crisis in particle physics," Research Policy (1976)

Profiles (Continued).

Nicholas C. Mullins (Ph.D. Harvard 1967, Sociology)

- a. Associate Professor of Sociology, Indiana University; Visiting Fellow, Institute for Advanced Study 1976-77
- b. Development of scientific disciplines and specialties; sociological theory
- c. "The group structures of two scientific specialties: a comparative study," (with others) 4S Proceedings (1976); "The National Science Foundation: an agency responding to changes in science," (with others) Social Studies of Science 5 (1975)

Eugene B. Skolnikoff (Ph.D. MIT 1965, Political Science)

- a. Professor of Political Science and Director, Center for International Studies, Massachusetts Institute of Technology
- b. Science and government; science and international relations
- c. "Science advice in the White House: a continuing debate," (with H. Brooks) Science (10 January 1975); "The relevance of Intelsat experience for the organizational structure of multinational nuclear fuel facilities," forthcoming in Sheays and Lewis, eds., International Arrangements for Nuclear Facilities

Henry Small (Ph.D. Wisconsin 1970, History of Science)

- a. Researcher, Institute for Scientific Information
- b. Development of scientific disciplines and specialties; scientific communication
- c. "Specialties and disciplines in the social sciences: a preliminary examination of the structure of the social sciences using the Social Sciences Citation Index," (with D. Crane) 4S Proceedings (1976); "The structure of scientific literature: Identifying and graphing specialties," and "Toward a macro- and microstructure for science," (with others) Science Studies 4 (1974)

Patricia K. Woolf (Ph.D. Johns Hopkins 1974, Communications)

- a. Visiting Fellow, Department of Sociology, Princeton University
- b. Scientific communication; diffusion of information about health care innovations
- c. "Origins of the Gordon Conferences," in press; "The second messenger: informal communication in cyclic AMP research," Minerva 13 (1975)

Dorothy S. Zinberg (Ph.D. Harvard 1966, Sociology)

- a. Director of Seminars and Special Projects, Program in Science and International Affairs, Harvard University
- b. Career development of scientists; international exchange of scientists
- c. "Education through science: the early stages of career development in chemistry," Social Studies of Science 6 (1976); "Changing trends in research travel of Western European and American scientists," National Academy of Sciences, forthcoming in 1977.

COUNCIL ELECTION: BALLOT

Vote for no more than five of the following by placing an X on the appropriate line.

- Donald DeB. Beaver _____
- Jonathan R. Cole _____
- A. Hunter Dupree _____
- Loren Graham _____
- Michael J. Moravcsik _____
- Nicholas C. Mullins _____
- Eugene B. Skolnikoff _____
- Henry Small _____
- Patricia K. Woolf _____
- Dorothy S. Zinberg _____

BALLOT FOR PROPOSED AMENDMENTS TO THE CHARTER OF THE SOCIETY

Pursuant to Section VI of the Charter, the following proposed amendments are herewith presented to the membership for vote by mail ballot. The amendments have been approved by the Council and by a majority of those voting at the Business Meeting of the Society in Ithaca on 5 November 1976. If a majority of those voting on this ballot supports each proposed amendment, the Charter will be revised as indicated.

Proposed amendment A increases the size of the Council by two members. Proposals B and C revise the quorum rule and periods of election to take into account the increased size of the Council. Proposals D and E provide for two standing committees.

In the following wording, bracketed sections are to be deleted; underlined sections are to be added. Indicate if you favor or oppose each proposed amendment.

- | | <u>FAVOR</u> | <u>OPPOSE</u> |
|--|--------------|---------------|
| A. Section II.B.1 | | |
| 1. The Society has the following elective officers: a president, a secretary-treasurer, and [five] <u>seven</u> other Council members. | _____ | _____ |
| B. Section II.B.2 | | |
| 2. [A majority of the] <u>Four</u> voting members of the Council constitutes a quorum. | _____ | _____ |
| C. Section II.B.7 | | |
| 7. [Three] <u>Four</u> members of the Council shall be elected in odd-numbered years, [two] <u>three</u> in even-numbered years. | _____ | _____ |
| <u>Add the following after Section II.B.2 and renumber subsequent sections accordingly:</u> | | |
| D. 3. There shall be a standing committee on annual meetings. | _____ | _____ |
| E. 4. There shall be a standing committee on publications. | _____ | _____ |

SPECIALTIES LIST

SCIENCE IN SOCIETY

- 11- Impact of society on science and technology
- 12- Social impact of science and technology
- 13- Public understanding and evaluation of science
- 14- Science education
- 15- Science policy
- 16- Science, technology and public policy
- 17- Technology assessment
- 18- Science in developing countries
- 19- Other (specify)

ORGANIZATION OF SCIENCE

- 31- Social backgrounds, mobility and manpower
- 32- Stratification and reward systems
- 33- Communication processes
- 34- Bibliometrics
- 35- Economics of research and development
- 36- Sociology of specialties and disciplines
- 37- Sociology of science, general
- 38- Sociology of technology
- 39- Other (specify)

SCIENCE IN HISTORY

- 21- Science as a cultural mode
- 22- Development of technology
- 23- Science-technology relationships
- 24- Scientific and technical societies
- 25- Development of disciplines
- 26- Development of professions
- 27- University science
- 28- National groupings
- 29- Other (specify)

SOCIAL STUDIES OF SCIENCE, not elsewhere classified

- 41- Personality of scientists
- 42- Creativity studies
- 43- Psychology of science, general
- 44- Ethnoscience
- 45- Philosophy of science
- 46- Ethics of scientific research
- 47- Social studies of science, general
- 48- Science indicators
- 49- Other (specify)

FORTHCOMING MEETINGS

ASA. The annual meeting of the American Sociological Association will be held 5-9 September 1977 in Chicago. Two sociology of science sessions have been scheduled by organizer and presider Maurice N. Richter, SUNY-Albany:

Sociology of Science: Scientific Careers

1. "Scientific Productivity, Sex, and Location in the Institution of Science"
Barbara F. Reskin (Indiana University)
2. "The Effect of Cumulative Advantage on Inequality in Science"
Paul D. Allison and Tad K. Krauze (Cornell University)
3. "A Network Analysis of Departmental Prestige Based on the Origins of Faculty Degrees"
John M. Sharp, Eui Hang Shin, and Leroy F. Smith (University of South Carolina)
4. "Institutional Status and Publication Rates in Professional Journals"
Suzanne Prescottt (Governors State University) and Mihaly Csikszentmihalyi (University of Chicago)
5. "Improving Measures of Scientific Contributions to Knowledge"
Duncan Lindsey (Washington University)

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Affix Stamp Here

Professor Robert McGinnis
4S Election
SASS/Department of Sociology
Cornell University
323 Uris Hall
Ithaca, NY 14853
USA

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Tear Out

ASA (Continued).

Sociology of Science: Functioning of the Scientific Community

1. "The Place of Knowledge in Scientific Growth: A Confluence Theory"
Kenneth E. Studer (Cornell University) and Daryl E. Chubin
(University of Pennsylvania)
2. "Science and Social Intelligence About Anomalies: The Case of Meteorites"
Ron Westrum (Eastern Michigan University)
3. "Generational Differences in Scientists' Research Interests"
Thomas F. Gieryn (Columbia University)
4. "Adjudication in Science: The Laetrile Controversy"
James C. Petersen and Gerald E. Markle (Western Michigan University)
5. Discussant: Sal P. Restivo (Rensselaer Polytechnic Institute)

BSHS. The summer meeting of the British Society for the History of Science will be held at the National Maritime Museum at Greenwich, England, 22-24 August 1977. The meeting will take the form of a Symposium on Scientific Instruments: Their Social and Economic Settings. Formal sessions will cover, among other things, Objects as Evidence, Theory and Practice, the Development of the Accuracy of Measurement, the Economics of Production, Social Attitudes, and Iconography. For further information, contact the Organising Secretary, Department of Navigation and Astronomy, National Maritime Museum, Greenwich, London SE10 9NF, England.

ISA. The Board of the International Sociological Association's Research Committee on the Sociology of Science has decided that the next meeting of this Committee will be held in Budapest on 7-9 September 1977. The meeting will take the form of a Conference; the Board has accepted the offer of the Institute of Sociology and the Research Group for Science Organization of the Hungarian Academy of Sciences to act as hosts and organizers of the Budapest Conference and to issue the invitations to it in the name of the ISA Research Committee. The deliberations of the Conference will be centered around three main subjects: (a) social aspects of contemporary science and technology with special regard to relations between scientific and technological progress in our times; (b) sociology of the research process; and (c) cultural contexts of science. Participants wishing to present a paper within the purview of these three main subjects are requested to submit their written contribution not later than 30 April 1977. A Refereeing Committee will select the papers to be presented verbally at the sessions of the Conference. Copies of these papers, and also of others accepted for official circulation, will be made available as far as possible before the sessions. The official language of the Conference will be English. However, an effort will be made to provide for bilingual English-Russian synchronous interpretation. The format of papers submitted cannot exceed a maximum of 20 double-spaced type-written pages; 10-12 pages are preferable. All communications concerning participation in the Conference, also typescripts, copies, etc., of papers submitted to the Conference, are to be addressed exclusively to the Secretary of the Local Organizing Committee: Janos Farkas, Institute of Sociology, Hungarian Academy of Sciences, Uri-utca 49, H-1014, Budapest, Hungary.

IUHPS. The XVth International Congress of the History of Science will be held 10-19 August 1977 in Edinburgh under the auspices of the International Union of the History and Philosophy of Science and sponsorship by UNESCO. The theme of the Congress is "Human Implications of Scientific Advance--Historical Perspectives." Among the symposia will be:

1. Science and Human Values

Among the important facets of this broad problem which will be explored, are the questions of how science has functioned as a cultural symbol within European civilisation, and how styles of scientific work vary among civilizations even to the extent of becoming keys to their identity.

Speakers include: C. Gillispie (USA), J. Salomon (France), S. Nakayama (Japan), R. Rashed (Egypt).

2. Internal and External Causation of Scientific Ideas

Case studies will be used to show how theoretical ideas not determined by the empirical logic of science itself, can be related to philosophical, theological, social, and political sources. The examination of such interactions between the so-called 'internal' and 'external' aspects of history of science should help to clarify the nature of this subject and its relationship to general history.

Speakers include: P. Rossi (Italy), A. Thackray (USA), G. Krober (GDR), P. Forman (USA), S. Mikulinsky (USSR), J. Ben-David (Israel).

3. International Cooperation and Diffusion in Science

The initial concern of this symposium will be with international cooperation and organization of science, particularly during the nineteenth and twentieth centuries. A subsequent theme for discussion will be national differences in the pattern of international science such as, for example, the diffusion of European science.

Speakers include: K. Biermann (GDR), M. Crosland (UK), B. Schroeder-Gudehus (Canada), N. Reingold (USA), M. Yaroshevsky (USSR), M. Watanabe (Japan).

4. Problems of Source Materials in the History of Science

This symposium will survey the work being done in France, the USSR, Great Britain, the USA, etc, to locate and preserve the extant records of scientists and technologists of both past and present times in these countries. The effectiveness of such efforts in stimulating more profound scholarship, particularly with regard to the history of twentieth century science, will be critically assessed.

Speakers include: G. Beaujouan (France), Margaret Gowing (UK), C. Weiner (USA), A. Hermann (FRG).

5. Classification and Systematization in the Sciences

The aim of this interdisciplinary symposium is to bring together historians and philosophers of different scientific disciplines who have an interest in general problems of classification--not restrictively biological classification--but who are usually separated by the traditional boundaries between sciences such as biology, medicine, chemistry, etc.

Speakers include: W. Albury (Australia), P. Sloan (USA).

Information on the IUHPS Congress may be obtained from the Congress Secretary, Eric G. Forbes, Royal Society of Edinburgh, 22 George Street, Edinburgh, Scotland EH2 WPQ.

RESEARCH IN PROGRESS

NSF Projects.

APS. The NSF Program in the History and Philosophy of Science and the NEH Division of Research Tools have jointly funded a three-year project to identify sources for research on the history of modern biochemistry and molecular biology under the direction of John T. Edsall, professor emeritus of Harvard University, and Whitfield J. Bell, Jr., librarian of the American Philosophical Society. The project, conducted at the American Philosophical Society Library, reports on its work in a free publication entitled Survey of Sources Newsletter, from which the following overview of the contents of the "Survey" was drawn.

The principal goal of the Survey of Sources for the History of Biochemistry and Molecular Biology is to attract scholars from a variety of disciplines to study various aspects of the development of these sciences in the past one hundred years. To be of value to these scholars, the Survey of Sources must draw their attention to interesting, substantive and unexplored research domains and be able to direct them to the primary and secondary source materials which will enrich their reports. The Survey must, therefore, be equipped to keep track of thousands of bibliographic references and to control information related to the contents of hundreds of personal and institutional archival collections. To furnish researchers with a bibliography relevant to their personal research topics, these references must be sufficiently detailed in their listing of such categories as personal names, dates, and subject matter of research to permit linking of categories of evidence. Furthermore, the researchers will wish to know something about the institutions, individuals, associations, publications, awards, research and teaching activities, and patronage which have shaped biochemistry and molecular biology in specific national, institutional or intellectual contexts over the past one hundred years. Therefore we would hope to be able to locate scientists and their work in chronological context, in their institutional framework, in relation to colleagues and students who compose the peer community, and in the context of available documentation.

It is hoped that--if the Survey of Sources can successfully manage these data--researchers will discover suggestive relationships in the history of ideas and in the relations of science and the broader cultural context, which will be susceptible to verification through analysis of linked source materials. If such expectations are fully met, many users besides historians should find the retrospective data base in biochemistry and molecular biology of considerable interest. Sociologists of science, philosophers, psychologists, as well as anthropologists, general historians, should be able to explore the data from their own perspectives and with the aid of distinctive methodologies.

For details about the Survey or access to this file, please contact David Bearman, Secretary to the Committee, American Philosophical Society Library, 105 South Fifth Street, Philadelphia, PA 19106.

Brass. Paul R. Brass (University of Washington, Seattle, WA 98195) has begun an EVIST-supported case study to extract, explore, and analyze some of the value assumptions and implications surrounding the transfer of innovative rice research and production techniques from the U.S. to South Asia. The approaches of anthropology, history, philosophy, political science, and sociology of science will be used to develop and compare composite value profiles of: 1) U.S. rice science and technology institutions, 2) interna-

Brass (Continued.)

tional rice research and development institutes, 3) South Asian rice development agencies and governments, and 4) South Asian producers and their communities. Selected for intensive study are the rice-producing portions of Louisiana, Texas, Arkansas, and Mississippi, the International Rice Research Institutes in the Philippines, and portions of the South Asian countries of Bangladesh, India and Sri Lanka. The analytical methods developed to explore this particular case will result in improved comprehension in both the rice science and technology and the international agricultural development communities of the complex character of the value bases which underlie the difficulties and potentials in the transfer of ideas and techniques between different social systems, and will enable improved assessment of their activities.

Campbell and McGinnis. In "Patents and Other Indicators of Applied Scientific Productivity," Richard Campbell and Robert McGinnis (Cornell University, Ithaca, NY 14853) are exploring applied scientific productivity in a scientific specialty. The purpose of the study is to determine the utility and feasibility of using patent data as indicators of the state of applied scientific research. The substantive area to be investigated is the steroid chemistry of primary sex hormones, the specialty area within which oral contraceptives were developed. In this project, the following questions are being addressed: What do patent indicators tell us about the productivity of individuals in applied fields which bibliometric indicators cannot? What can patent indicators tell us about an applied specialty or problem domain's growth? To what extent can differences in individual productivity be accounted for by biographic variables?

Gerwin and Newsted. Donald Gerwin and Peter Newsted (University of Wisconsin, Milwaukee, WI 53201) are engaged in a project on "Scientific Hypothesis Formulation" supported by the Memory and Cognition program of NSF. The psychological literature on discovery has traditionally been highly descriptive, emphasizing case histories and the reminiscences of famous scientists. Only recently have some psychologists begun to move the field toward the mainstream of cognitive theorizing by speculating on thinking processes. The objective of the project is to retain the rigorous tradition of inductive research, but at the same time make it more relevant for understanding the discovery process. This involves incorporating key aspects of discovery reported in case histories into laboratory studies of inference making. A new laboratory environment called function finding, inferring a mathematical function from samples of its coordinate values, which resembles scientific inference more than existing laboratory situations, has been developed. Investigations have been conducted into the ways scientists solve this task and comparisons made with how students perform. The effects of altering the representation of coordinate values from a list to a graphical format have also been studied. This work has immediate relevance for science education as it implies the importance of pictorial displays and analogies in learning materials.

Hattery. Lowell H. Hattery (American University, Washington, DC 20016) is directing a project to study the process of university and other nonprofit research management. The study will consist of (i) reviewing the principal findings of 35 project grants made by NSF's Research Management Improvement Program between 1972 and 1974, and (ii) disseminating these evaluations and the reviews of four professional associations--AAAS, ACE, the National Council of University Research Administrators, and the Society for Research Administrators--also participating in the RMI program.

Iltis. In "Changing Views of Nature in the Scientific Revolution" Carolyn Iltis (University of San Francisco, San Francisco, CA 94117) is making a comparative study of sixteenth and seventeenth century organic philosophies of nature for the purpose of clarifying the transition from organicism to mechanism in the scientific revolution and for casting new light on the problem of the domination of nature. She classifies the organic philosophies as (1) Neoplatonic natural magic, (2) Renaissance naturalism, (3) vitalism, and (4) Cambridge Platonism. She is studying their relationship to Aristotelian, Platonic, and Stoic ideas, their analysis of matter and change, their view of human agency in nature and which ideas were thrust aside from the mainstream developments. The results of her research will provide a new interpretation of important aspects of the scientific revolution and help to clarify the nuances in the broader transition to the mechanical view of nature.

Mullins and Hargens. Nicholas Mullins and Lowell Hargens (Indiana University, Bloomington, IN 47401) are studying "The Social Structure of Scientific Specialties," with emphasis on (1) the sociometric ties and social-role structures exhibited by specialties, and (2) the distribution and impact of funding on research by specialty groups. The first of these emphases yields information needed to test models of specialty growth and change, while the second yields information of interest to students of science policy and stratification in science. Under the earlier support they have collected sociometric data for three biomedical specialties and for a specialty in physical chemistry and data on funding for each of these four specialties. They are currently collecting and analyzing data on two additional physical science specialties, two behavioral science specialties and two formal (mathematical) specialties. With this data they are able to test their theory of specialty development across disciplines and can assess the role of individual scientists in the growth of a specialty.

Sklar. Spacetime theories, and the overall physical theories of which they are components, are among the most completely and clearly systematized portions of our scientific theorization. Largely for this reason, they have provided important touchstones for philosophical thinking about theories in general. For a number of years research has been devoted to bringing together the resources of contemporary spacetime theories in physics and contemporary methodological results in the philosophy of science in order to explore the illumination these areas of investigation shed on each other. This project on "Philosophical Foundations of Spacetime Theories" is an investigation into two proposals to "reduce" spatio-temporal notions to concepts not prima facie spatio-temporal: namely, the causal theory of spacetime topology and the entropic theory of the "direction of time." Sklar is also continuing his recent research on the problem of accepting and rejecting hypotheses in science. The core of this research is an examination of criteria for theory choice over and above conformity of hypothesis with the "observational data," exploring the extent to which such criteria can allow us to narrow the realm of theoretical "under-determination" and the extent to which a rationale for such methods can be provided in a methodology which acknowledges truth as at least one aim of the theoretical enterprise. Write to Lawrence Sklar at the University of Michigan, Ann Arbor, MI 48105.

White and Sullivan. In "Collaborative Research on A Social Analysis of A Scientific Specialty: The Physics of Weak Interactions," D. Hywel White (Cornell University, Ithaca, NY 14853) and Daniel Sullivan (Carleton College, Northfield, MN 55057) are continuing their sociological and historical study of a specialty in elementary particle physics. The project is moving from a phase where almost all of their effort was devoted to designing and creating a large, complex data base to a phase of initial exploitation of these data for a wide range of analyses. With this data base, they are investigating (1) the interdependence of theory and experiment; (2) the specialization of scientists into theoretical, phenomenological and experimental roles; (3) the consequences of technological specialization among experimentalists; and (4) the changing intellectual dependence of the specialty on other areas of high energy physics.

Other Projects and Research Opportunities.

AIP. The American Institute of Physics' Center for History of Physics has served historians and sociologists of science and others for over ten years. Resources include (1) interviews with over 300 scientists covering all aspects of their careers; many of the interviews are subject/indexed. The Center has been the depository of choice for a number of historical and sociological surveys, not only of physicists, but covering all the natural sciences; (ii) the National Catalog of Sources for History of Physics and Astronomy containing detailed inventories of holdings of scientists' papers at repositories throughout the United States and abroad; (iii) archives including papers of individuals and societies, manuscript autobiographies, histories of physics departments, etc.; (iv) a newsletter, free upon request, with information about recent deposits of papers, current activity in the history of the physical sciences; (v) books covering the entire history of modern physics (8000 vols) available by personal or interlibrary loan; and (vi) audio-visual materials including 400 tapes and 10,000 photographs available for research or educational use. For information on these and other resources contact Spencer Weart, Director, Center for History of Physics, American Institute of Physics, 335 East 45th Street, New York, NY 10017.

Also at the AIP is the Manpower Statistics Division which regularly surveys the education and employment of physicists and astronomers, relying on questionnaires and a large data base, in part computerized, extending back to the early 1960s. A number of reports are published each year covering changing patterns of physics enrollments and degrees at all levels, areas of specialization, post-graduation plans, use of physics training in initial employment, etc. Reports and unpublished data are also available from an extensive demographic and employment survey of the entire physics community conducted in 1973. Special current studies focus on career paths of physicists changing or leaving academic institutions, the data to be available in the fall of 1977. For further information contact Beverly Fearn Porter, Director, Manpower Statistics Division, American Institute of Physics, at the address above.

CSAC. The Contemporary Scientific Archives Centre reports that its three-year existence has been extended through the support of the Royal Society and the Council of Engineering Institutions of the United Kingdom. The Centre continues to host the visits of librarians, archivists, and historians of science, all of whom are invited to utilize the deposits or participate in the collection of materials by several notable natural scientists. For further information contact the Centre's Director, Margaret Gowing, at 10 Keble Road, Oxford OX1 3QG, England.

FINEP. FINEP (Studies and Projects Financing Agency) and the Brazilian National Council of Scientific and Technological Development, with the cooperation of the Center for Research and Documentation in Contemporary History of the Getulio Vargas Foundation, are sponsoring a project on the "Social History of Brazilian Science." The main objective of the project is to trace the central lines of development of modern science in Brazil, pointing out the institutional and social variables that might explain the relative success or failure of each. In this process, open interviews are being made with a selected group of pioneers of modern science in the country, and all kinds of bibliographical references and documentary sources are being searched. This is probably the first systematic work on the sociology of science in Brazil, and a few by-products are expected to follow after the first two years of research. One is a documentary basis for future research. Another is a series of specifically oriented projects on given scientific subfields and selected institutions. At this time, about thirty in-depth interviews are being made and will become the basis of an oral history archive; monographic studies are being done on the Escola de Minas de Ouro Preto and the History of Siderurgy in Minas Gerais. A report on the development of Physics and a general report on the historical roots of modern science in Brazil are expected to come out next year. For further information and working papers, write to Simon Schwartzman, FINEP, Av. Rio Branco 124, 90, Rio de Janeiro, Brazil.

ISS. NSF has established an International Science Studies Program (ISS), reflecting the increasing importance of international scientific and technological activities to U.S. foreign policy and scientific interests. Initially, ISS is concentrating on (i) program planning, particularly efforts to improve and extend current U.S. government and NSF activities; (ii) evaluation studies; (iii) periodic surveys of the status of international science and technology, particularly American involvement, and (iv) efforts to promote regional and international scientific cooperation. For further information, contact Aaron Segal, Program Manager, International Science Studies, Division of International Programs, NSF, Washington, DC 20550.

IDOE. NSF has established a Marine Science Affairs Program as part of its Office for the International Decade of Ocean Exploration (IDOE). The program will support research on the social, economic, political, and managerial aspects of large-scale, long-term IDOE projects in Environmental Quality, Environmental Forecasting, Seabed Assessment, and Living Resources. Additional information may be obtained from Lauriston R. King, Program Manager, Marine Science Affairs, Office for the International Decade of Ocean Exploration, NSF, Washington, DC 20550.

Survey of Archives. The Office for History of Science and Technology at the University of California (Berkeley) is undertaking a worldwide survey of archival holdings related to 20th century physics. The resultant published inventory will locate and identify correspondence and unpublished papers of approximately 1000 physicists active between 1900 and 1950. Of particular interest is documentation of contact between physicists and intellectuals outside the domain of academic physics. Readers with special knowledge of unpublished correspondence involving physicists', letters published in journals not likely to be known to historians of science, and archival holdings of the papers of little-known physicists, are urged to relay this information to the Survey of Archives, Office for the History of Science and Technology, University of California, 470 Stephens Hall, Berkeley, CA 94720.

IN THE LITERATURE

Forthcoming Books.

Science, Technology and Society, A Cross-Disciplinary Perspective. A major new work in science policy studies, Science, Technology and Society, is an important step in the international organization of scholars in several social science disciplines who share an interest in examining the social and policy dimensions of science and technology. This volume presents specially commissioned studies of particular subject and methodological approaches which together form a crucial framework for future research and debate in this interdisciplinary, international field. The book is edited by Ina Spiegel-Rösing and Derek de Solla Price, under the aegis of the International Council for Science Policy Studies. It will be published in May 1977 (approx. 650 pp) by Sage Publications, Inc., 275 South Beverly Drive, Beverly Hills, CA 90212. The cost until August 1977 is \$25. The contents are as follows:

Preface

PART I: The Normative and Professional Contexts

The Study of Science, Technology and Society (SSTS): Recent Trends and Future Challenges Ina Spiegel-Rösing
 Science Policy Studies and the Development of Science Policy Jean-Jacques Salomon
 Criticisms of Science J. R. Ravetz

PART II: Social Studies of Science: The Dicipinary Perspectives

Sociology of the Scientific Research Community Michael J. Mulkey
 Changing Perspectives in the Social History of Science Roy M. MacLeod
 Conditions of Technological Development Edwin T. Layton
 Economics of Research and Development Christopher Freeman
 Psychology of Science Rudolf Fisch
 Models for the Development of Science Gernot Böhme

PART III: Science Policy Studies: The Policy Perspective

Scientists, Technologists and Political Power Sanford A. Lakoff
 Technology and Public Policy Dorothy Nelkin
 Science, Technology and Military Policy Harvey M. Sapolsky
 Science, Technology and Foreign Policy Brigitte Schroeder-Gudehus
 Science, Technology and the International System Eugene Skolnikoff
 Science Policy and Developing Countries Z. Sardar and Dawud G. Rosser-Owen

Sociology of Sciences, A Yearbook is an annual publication that will bring together articles around particular themes in the sociology of the sciences as a means of contributing to the development of a comparative, cross-disciplinary understanding of the sciences. By publishing research from a number of perspectives and approaches on a specific topic, the Yearbook will provide an

Sociology of Sciences, A Yearbook (Continued).

opportunity for the integration of different disciplinary strategies and their interrelated development. The term sociology in the title is thus meant broadly, including historical and philosophical dimensions, and does not refer to a narrow, professionalized conception of the field. Comparisons across cultures and historical periods will be a major feature of the Yearbook, as will analyses of the institutionalization of scientific knowledge as distinct cognitive structures, and their relations with other forms of understanding institutionalized in different societies. Volume I (1977, 285 pp), entitled "The Social Production of Scientific Knowledge," is edited by E. Mendelsohn, P. Weingart and R. D. Whitley. It will appear Spring 1977, published by D. Reidel Publishing Company, Inc., Lincoln Building, 160 Old Derby Street, Hingham, MA 02043, U.S.A. Send \$22.50 for cloth and \$12.95 for paper. The contents of Volume I are:

Editorial Statement

The Institutionalization of the Sciences: Changing Concepts and Approaches in the History and Sociology of Science.

The Social Construction of Scientific Knowledge	Everett Mendelsohn
The Social Construction of Science:	
Institutionalization and Definition of	
Positive Science in the Latter Half of the	
Seventeenth Century	Wolfgang van den Daele
Problems of a Historical Study of the Sciences	Wolf Lepenies
Scientific Ideology and Scientific Process:	
The Natural History of a Conceptual Shift	Roger G. Krohn

Social Relations of Cognitive Structures in the Sciences

Ontological and Epistemological Commitments	
and Social Relations in the Sciences: The	
Case of the Arithmomorphic System of	
Scientific Production	Phyllis Colvin
Cognitive Norms, Knowledge-Interests and	
the Constitution of the Scientific Object:	
A Case Study in the Functioning of Rules	
for Experimentation	Gernot Bohme
Changes in the Social and Intellectual	
Organization of the Sciences:	
Professionalization and the Arithmetic	
Ideal	Richard Whitley
What Does a Proof Do If It Does Not Prove?	
A Study of the Social Conditions and	
Metaphysical Divisions Leading to	
David Bohm and John von Neumann Failing	
to Communicate in Quantum Physics	Trevor Pinch

Social Goals, Political Programmes and Scientific Norms

The Political Direction of Scientific Development	Wolf Krohn, Wolfgang van den Dael, Peter Weingart
Scientific Purity and Nuclear Danger: the Case	
of Risk Assessment	Helga Nowotny
Creation vs. Evolution: The Politics of Science	
Education	Dorothy Nelkin

Toward A Metric of Science. Essays Occasioned by the Advent of Science Indicators. The decision of the National Science Board to initiate a biennial series of "Science Indicator" reports made abundantly plain the need for basic improvement in the measurement of science. The aim of Toward a Metric of Science is to begin laying part of the groundwork, not the specific techniques, for such improvement by providing critical discussion of science indicators, as concept and as practice -- a discussion involving historians, sociologists, political scientists and economists of science; physical, life and social scientists themselves; and experts drawn from the antecedent social-indicators movement. The editors thus unite in the hope that others will find in this volume an invitation to serious thought on the metric of science, and the stimulus to providing more developed understandings than the field yet affords. Toward A Metric of Science is edited by Yehuda Elkana, Joshua Lederberg, Robert K. Merton, Arnold Thackray and Harriet Zuckerman. It will be published in Fall 1977 by Wiley-Interscience Publications, 605 Third Avenue, New York, NY 10016. The contents are as follows:

Preface

PART I. Orientations

Measurement in the Historiography of Science	Arnold Thackray
Science Indicators and Social Indicators	O. D. Duncan
Can Science Be Measured?	Gerald Holton
Toward a Model for Science Indicators	Derek de Solla Price
Models of Scientific Output	Manfred Kochen

PART II. Particulars

Precarious Foundations of Social Data	William Kruskal
Economic Problems of Measuring Returns on	
Research	Zvi Griliches
Citation Data as Science Indicators	Eugene Garfield, Morton Malin, Henry Small
Measuring the Cognitive State of Scientific	
Disciplines	Stephen Cole, Jonathan Cole, Lorraine Dietrich
Difficulties in Indicator Construction:	
Notes and Queries	Hans Zeisel

PART III. Contexts

From Parameters to Portents -- and Back	John Ziman
Political Contexts of Science Indicators	Yaron Ezrahi

Journals, Newsletters and Guides.

BJHS. The British Journal for the History of Science is published thrice yearly. Editor Nicholas Fisher invites the submission of sociological analyses. He also reports that the 7th British Society for the History of Science list of 430 theses is now available free to members (£1 or \$3 to non-members). It may be obtained from The Administrator, BSHS, Halfpenny Furze, Mill Lane, Chalfont St. Giles, Buckinghamshire HP8 4NR, England.

Consciousness and Culture. The Humanistic Transdisciplinary Association has begun to publish Consciousness and Culture: The New Journal of Transdisciplinary Synthesis (edited by John-Raphael Staude). The journal seeks to (i) explore the social implications and applications of research in the psychology, sociology, and anthropology of consciousness and culture, (ii) stimulate creative thinking and new understandings of ancient as well as emerging cultures, and (iii) integrate the truths about human beings and society now scattered among many disciplines. A one-year subscription costs \$10 for individuals and \$15 for institutions. Make checks payable to H.T.A., Box 345, Orinda, CA 94563.

MIT Directory. An annotated directory of science communication courses and programs is being compiled this spring by Sharon Friedman of the Division of Journalism at Lehigh University, Rae Goodell of the School of Humanities at MIT, and Lawrence Verbit of the Department of Chemistry at SUNY Binghamton. The directory will be a guide to educational activities concerned with communication of science to the public, such as courses in science writing, science communication, engineering communication, and environment and the media. It will include courses at the undergraduate and graduate levels, as taught in science, engineering, and environment programs, as well as journalism, humanities, and social science departments. Anyone whose course or program might be appropriate for the directory should send a postcard or brief note indicating name, address, telephone number, and course title(s) to: Dr. Rae Goodell, Room 20B-224, Massachusetts Institute of Technology, Cambridge, MA 02139. References to others teaching in this field would also be appreciated. There will be no mail survey to seek out science communication courses; information will be collected by notices in newsletters and word-of-mouth. The directory will also be used to plan a workshop on the teaching of science writing at the 1977 meeting of the Association for Education in Journalism (AEJ) in Madison, WI.

STS Guide. The Cornell Program on Science, Technology and Society has produced a directory (compiled and edited by Ezra D. Heitowit, Janet Epstein, and Gerald M. Steinberg) entitled Science, Technology and Society: A Guide to the Field. In this 600-page volume, teaching and research activities are listed for nearly 400 U.S. colleges and universities, featuring descriptions of over 2,000 courses and 100 formal programs, institutes, centers, etc. STS-related activities are indexed for professional organizations, research corporations, government agencies, and public interest groups. A listing of bibliographic resources and periodicals is also included. While a limited supply lasts, the Guide is available gratis from Program on Science, Technology and Society, Cornell University, 620 Clark Hall, Ithaca, NY 14853. Thereafter copies can be ordered through the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

SISCON. The SISCON Council invites subscriptions to the expanded SISCON Newsletter at a cost of £2 (\$5 U.S.) for individuals and £10 (\$25 U.S.) for institutions. Subscribers will also receive (i) notice of all new SISCON publications (institutional subscribers will receive one free copy of each publication), (ii) reduced rates for attendance at SISCON organized conferences, (iii) the option of buying past and future SISCON publications at cost, and (iv) access to support and expertise in the establishment and development of SISCON-type courses. Make checks payable to SISCON and send to SISCON Project, Department of Liberal Studies in Science, The University, Manchester M13 9PL England. Address inquiries to Michael Gibbons, SISCON Co-ordinator at the same address.

Recent Publications.

Lubrano. Linda L. Lubrano has just authored Soviet Sociology of Science, the first monograph in English that reviews the sociological dimension of science as it has developed in the USSR. Recent Soviet literature examined in the monograph treats science as a form of social behavior and focuses on the relationships between science and society. In this literature Soviet scholars have analyzed scientific research in terms of the interaction between social conditions and the individual characteristics of the scientist. The notion of science as a social institution has led the Soviets to pay particular attention to the social impact of the scientific-technical revolution as well as to questions of organization and management of scientific activity. The monograph examines these questions in a detailed and systematic fashion. The sociology of science, as viewed by the Soviets, is part of a broader field of inquiry, naukovedenie, which studies science from a variety of disciplinary perspectives. Accordingly, the monograph opens with an assessment of naukovedenie as an academic field and a description of the key institutions engaged in naukovedenie since the mid-1960s. A selected bibliography of Soviet sources is included. Send orders (the price is \$4.95) or inquiries to The American Association for the Advancement of Slavic Studies, 190 West 19th Avenue, Columbus, OH 43210.

Perspectives. Beginning in 1973, Project PAREX has sponsored a series of interdisciplinary, comparative and international studies in the history and sociology of scientific development. One important focus of research has been the concept of the scientific specialty, discipline or network -- the principal means of organizing inquiry which, since the turn of the nineteenth century, has provided the chief intellectual and institutional orientation for scientific research. Perspectives on the Emergence of Scientific Disciplines, edited for Project PAREX by Gerard Lemaire, Roy MacLeod, Michael Mulkay, and Peter Weingart: (Chicago: Aldine, 1977 282 pp, \$22.50) attempts to outline a research program in this area, building upon a series of historical and sociological interpretations and offering a set of methodological guidelines. The volume includes:

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| W. Krohn & W. Schafer | The Origins and Structure of Agricultural Chemistry |
| P. Costabel | Du Centenaire d'une Discipline Nouvelle: La Thermodynamique |
| R. G. A. Dolby | The Case of Physical Chemistry |
| M. Worboys | The Emergence of Tropical Medicine: A Study in the Establishment of a Scientific Specialty |
| J. D. De Certaines | La Biophysique en France: Critique de la Notion de Discipline Scientifique |
| J. Law | The Development of Specialties in Science: The Case of X-ray Protein Crystallography |
| M. J. Mulkay & D. O. Edge | Cognitive, Technical and Social Factors in the Growth of Radio Astronomy |
| G. N. Gilbert | The Development of Science and Scientific Knowledge: The Case of Radar Meteor Research |

Perspectives (Continued).

N. J. Mulkey	Methodology in the Sociology of Science: Some Reflections on the Study of Radio Astronomy
J. Law	Theories and Methods in the Sociology of Science: An Interpretative Approach
S. W. Woolgar	The Identification and Definition of Scientific Collectivities
W. Van Den Daele & P. Weingart	Resistance and Receptivity of Science to External Direction: The Emergence of New Disciplines Under the Impact of Science Policy

Recent Publications (A-Me).

1. Aked, N.A. and P.J. Gummert, "Science and Technology in the European Communities: the History of the COST Projects." Research Policy 5 (1976): 270-294.
2. Akin, William E., Technocracy and the American Dream: The Technocrat Movement, 1900-1941 (Berkeley: University of California Press, 1976).
3. Alexandrov, A. et al, Science and Morality. Progress Publishers: distributed by Imported Publications (1975, 277 pp, cloth \$3.25).
4. American Chemical Society, Professionals in Chemistry: 1975. Washington, DC (120 pp, paper \$10, to members \$5).
5. Anderson, Robert S., Building Scientific Institutions in India. Saha and Bhabha. Montreal: McGill University Centre for Developing-Area Studies (1975, 124 pp, paper \$3.50, developing countries \$2).
6. Bainbridge, William Sims, The Spaceflight Revolution: A Sociological Study. New York: Wiley-Interscience (1976, \$16.95).
7. Belkin, Nicholas J. and Stephen E. Robertson, "Information science and the phenomenon of information." JASIS 27 (July/August 1976): 197-204.
8. Bennett, William and Joel Gurin, "Science that frightens scientists: the great debate over DNA," Atlantic 239 (February 1977): 43-62.
9. Berendzen, Richard, Richard Hart, and Daniel Seeley, Man Discovers the Galaxies. New York: Science History Publications (1976, 228 pp, cloth \$15.95, paper \$6.95).
10. Bhaneja, B. and M. Gibbons, "Scientific Research and Accountability: Attitudes of the Political Executive, Scientists and Civil Servants, 1952-70." Indian Journal of Public Administration, XXII (1976).
11. Blau, Judith R., "Scientific recognition: academic context and professional role." Social Studies of Science 6 (September 1976): 533-545.
12. Blumberg, Stanley A. and Gwinn Owens, Energy and Conflict, The Life and Times of Edward Teller. New York: Putnam (1976, 492 pp, \$9.95).
13. Broadwin, John A., "An analysis of the Internationale Bibliographie der Zeitschriftenliteratur." Jour. Document 32 (March 1976): 26-31.

Recent Publications (Continued).

14. Byrnes, Robert F., Soviet-American Academic Exchanges, 1958-1975. Bloomington: Indiana University Press (1976, 276 pp, paper \$10).
15. Cardwell, D.S.L., "Science and technology: the work of James Prescott Joule," Technology and Culture 17 (October 1976): 674-687.
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17. The Centrality of Science and Absolute Values. Proceedings of a Conference, New York, Nov. 1975. Tarrytown, NY: International Cultural Foundation (1976, two volumes, 1346 pp, cloth \$39.95, paper \$14.95).
18. Chubin, Daryl E., "The conceptualization of scientific specialties." The Sociological Quarterly 17 (Autumn 1976): 448-476.
19. Clark, C.V., "Obsolescence of the patent literature." Jour. Document 32 (March 1976): 32-52.
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21. Costello, John and Terry Hughes, The Concorde Conspiracy: The International Race for the SST. New York: Charles Scribner's Sons (1976, \$12.95).
22. Council for Science and Society, Superstar Technologies (London: Barry Rose Publishers, Ltd., 1976).
23. Cournand, Andre and Michael Meyer, "The scientist's code." Minerva 14 (Spring 1976): 79-96.
24. Diamond, N., "Politics of scientific conceptualization." Science for the People 8 (May 1976): 14-17, 40.
25. Evans, Richard I., The Making of Psychology. Discussions with Creative Contributors. New York: Knopf (1976, 382 pp, paper \$5.95).
26. Fraser, John, "Louis Althusser on science, Marxism and politics." Science and Society 40 (Winter 1976-1977): 438-464.
27. Giddens, Anthony, "Functionalism: Apres la Lutte," Social Research, 43 (Summer 1976): 325-366.
28. Gilbert, G. Nigel, "The transformation of research findings into scientific knowledge." Social Studies of Science 6 (September 1976): 281-306.
29. Gasfield, Joseph, "The literary rhetoric of science: comedy and pathos in drinking driver research," ASR 41 (February 1976): 16-34.
30. Hammond, Kenneth R. and Leonard Adelman, "Science, Values and Human Judgment." Science 194 (22 October 1976): 389-396.
31. Harwood, Jonathan, "The race-intelligence controversy: A sociological approach--I: professional factors." Social Studies of Science 6 (September 1976): 369-394.
32. Henry, Nicholas, Copyright--Information Technology--Public Policy. Part 2, Public Policies--Information Technology. New York: Dekker (1976, 166 pp, \$14.50, Books in Library and Information Science).
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Recent Publications (Continued).

34. Hughes, Thomas Parke, "The science-technology interaction: the case of high-voltage power transmission systems." Technology and Culture 17 (October 1976): 646-662.
35. Hutchings, Raymond, Soviet Science, Technology Design. Interaction and Convergence. New York: Oxford University Press (1976, for the Royal Institute of International Affairs, 320 pp, \$27.50).
36. Jevons, F.R., "The interaction of science and technology today, or, Is Science the Mother of Invention?" Technology and Culture 17 (October 1976): 729-742.
37. Johnston, R., "Contextual Knowledge: a model for the overthrow of the internal/external dichotomy in science." Australian and New Zealand Journal of Sociology 12 (October 1976): 193-203.
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40. Kistiakowsky, George B., A Scientist at the White House. The Private Diary of Eisenhower's Special Assistant for Science and Technology. Cambridge: Harvard University Press (1976, \$15).
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42. Lambricht, W. Henry, Governing Science and Technology. NY: Oxford University Press (1976, cloth \$9.00, paper \$4.00).
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THIS LIST WILL BE CONTINUED IN THE SUMMER ISSUE OF THE 4S NEWSLETTER.

4S Society for Social Studies of Science

The 4S Newsletter is published four times each year at the Department of History and Sociology of Science, University of Pennsylvania, Philadelphia, PA 19174, and sent to all members of the Society for Social Studies of Science. Membership is on a calendar year basis. Membership dues (\$10 for professionals, \$5 for students) and institutional subscriptions (\$20) should be sent to: The Secretary/Treasurer, 4S, SASS, 323 Uris Hall, Cornell University, Ithaca, NY 14853. Renewals are handled by Neale Watson Academic Publications, Inc., 156 Fifth Avenue, New York, NY 10010.

Production Assistants: Elizabeth Cooper, Sylvia Dreyfuss
Editorial Assistant: Jeffrey Sturchio

CALL FOR NEWS

Material for inclusion in the Summer issue of the 4S Newsletter should be sent by 15 May, to the Managing Editor, Department of History and Sociology of Science, E.F. Smith Hall D6, University of Pennsylvania, Philadelphia, PA 19174, U.S.A.



Department of History and
Sociology of Science
University of Pennsylvania
Edgar Fahs Smith Hall/D6
Philadelphia, PA 19174

